What is Claimed:

1. A deformable hearing aid, for insertion into a user's ear canal, comprising:

a plastic skin having a bounding wall which defines an internal, component receiving volume wherein the skin is compliant;

at least one electrical component, surrounded by an open cell deformable matrix and positioned in the volume wherein the matrix exerts expansive forces on an internal periphery of the skin causing same to assume an expanded state in the absence of compressive forces whereupon the skin and matrix assume a deformed state while being inserted into the user's ear canal due to compressive forces exerted thereon by the ear canal whereupon ambient air is forced from the volume reducing same.

2. A hearing aid as in claim 1 wherein the component is not distorted while the housing is being inserted.

3. A hearing aid as in claim 1 whereupon, when inserted in the ear canal, the matrix applies expansive forces to the skin forcing same into contact with the periphery of the ear canal thereby creating a flexible, feedback reducing seal.

4. A hearing aid as in claim 3 which, when inserted, exhibits a smaller internal volume than prior to insertion.

5. A hearing aid as in claim 4 which includes a flow port, coupled to the internal volume, from which internal ambient air can be expelled during insertion.

6. A hearing aid as in claim 5 wherein the matrix can increase the internal volume and external ambient air can flow thereinto, via the port, in response to changes in the shape of the ear canal.

7. A hearing aid as in claim 1 wherein the matrix is selected from a class which includes an open cell foam, a fabric and a porous solid.

8. A hearing aid as in claim 1 wherein the skin carries a plurality of molded protrusions on an exterior periphery.

9. A hearing aid as in claim 8 wherein spaces between protrusions facilitate drying of the ear canal.

10. A hearing aid as in claim 1 wherein the skin comprises an elastomer

selected from a class which includes silicone, polyurethane, latex and polyvinyl-chloride.

11. A hearing aid as in claim 1 wherein the skin has a thickness less than 0.050 inches.

12. A hearing aid as in claim 1 wherein the skin exhibits a hardness parameter in a range on the order of 10 ShoreA to 40 Shore A.

13. A hearing aid as in claim 1 wherein the electrical component comprises an audio output transducer.

14. A hearing aid as in claim 13 which includes an audio input transducer coupled to and to the output transducer.

15. A hearing aid as in claim 14 which includes a faceplate attached to the skin.

16. A hearing aid as in claim 15 wherein the faceplate is rigid and is attached to the skin, at least in part, with one of adhesive, sonic welding, and heat staking..

17. A hearing aid as in claim 1 wherein the wall has a substantially constant thickness.

18. A hearing aid as in claim 3 wherein as the ear canal changes shape, the skin deforms with the internal volume decreasing and increasing in accordance with forces applied by the ear canal.

19. A hearing aid as in claim 18 wherein the volume of the matrix decreases and increases in response to changes in the shape of the ear canal.

20. A hearing aid as in claim 18 which includes a plurality of ribs integrally attached to an exterior periphery of the skin.

21. A hearing aid comprising:

a deformable skin which bounds an internal region and wherein the skin does not exhibit sufficient rigidity to be insertable into a user's ear canal; and

at least one spine which extends axially along an interior surface of the skin and is attached thereto sufficiently so as to provide insertion rigidity when inserted into the user's ear canal.

22. A hearing aid as in claim 21 wherein the skin is formed of an elastomer

selected from a class which includes silicone, polyurethane, latex, and polyvinyl-chloride.

23. A hearing aid as in claim 21 which includes an output transducer wherein the skin and spine, but not the output transducer, are distorted on insertion into the ear canal.

24. A hearing aid as in claim 21 wherein the spine comprises a vent tube that is attached to the skin substantially along its length.

25. A hearing aid as in claim 21 which includes a deformable matrix in the region wherein the matrix applies expansive forces to the skin.

26. A hearing aid as in claim 21 wherein the at least one spine is integrally molded with the shell.

27. A hearing aid as in claim 25 wherein the matrix is compressible in response to forces applied by the ear canal whereby a volume parameter of the internal region is dynamically alterable in response to applied ear canal forces.

28. A hearing aid as in claim 26 which includes a plurality of ribs formed on an exterior periphery of the skin.

29. A hearing aid as in claim 21 which includes an audio output transducer in the internal region wherein the transducer is surrounded, at least in part, by a compressible matrix.

30. A hearing aid as in claim 29 wherein the matrix pre-loads the skin with outwardly directed expansive forces.

31. A hearing aid as in claim 29 wherein the matrix comprises at least one of an open cell foam, a closed cell foam, and a fabric.

32. A hearing aid as in claim 25 wherein the expansive forces contribute to the skin forming a seal with the user's ear canal, wherein as the shape of the ear canal changes, due to movement of the user's jaw, the seal is broken, permitting air flow into the canal, and reforms as the matrix continues to apply expansive forces to the skin.

33. A hearing aid as in claim 27 wherein the expansive forces contribute to the skin forming a seal with the user's ear canal, wherein as the shape of the ear canal changes, due to movement of the user's jaw, the seal is broken, permitting air flow into the canal, and reforms as the matrix continues to apply expansive forces to the skin.

34. A hearing aid as in claim 27 which includes a faceplate attached to the skin.

35. A compressible hearing aid housing comprising:

a deformable exterior plastic sheath with a bounding side wall and a substantially closed end which define an interior region and wherein the sheath exhibits an undistorted shape with a maximal internal volume in the absence of exterior compressive forces wherein the sheath is not self-supporting;

an air containing matrix formed of a deformable plastic wherein the matrix is positioned in at least part of the interior region, wherein the matrix defines at least one component receiving region whereby the matrix at least in part, displaces the component receiving region from the sheath, wherein the matrix exerts an outward biasing force relative to the sheath to cause said sheath to expand toward its undistorted shape in the absence of external compressive forces whereupon air contained in the sheath is expelled therefrom in response to externally applied compressive forces reducing the internal volume of the sheath thereupon limiting atmospherically induced expansive forces.

36. A housing as in claim 35 wherein the volumes of both the sheath and the matrix are reduced in response to applied external compressive forces.

37. A housing as in claim 35 wherein the matrix comprises an open cell foam which fills the interior region of the sheath, at least in part.

38. A housing as in clam 35 wherein the sheath is selected from a class which includes polyurethane, silicon, and polyvinyl chloride.

39. A housing as in claim 35 wherein the sheath comprises an elastomer.

40. A housing as in claim 35 wherein the sheath exhibits a nominal wall thickness in a range on the order of 1 thousand to 60 thousandths of an inch.

41. A housing as in claim 35 wherein the sheath exhibits a hardness comparable to fleshier portions of an human ear canal.

42. A housing as in claim 35 wherein the sheath exhibits a hardness in a range of the order of four to forty Shore A.

43. A housing as in claim 35 wherein the sheath exhibits axial stretchability in a range on the order of two to five times its nominal, unstretched length.

44. A housing as in claim 35 wherein the matrix exhibits a first, restorative time constant comparable to a time constant of a human ear canal exhibiting a change of shape.

45. A housing as in claim 35 which includes at least one electronic component contained within the matrix.

46. A housing as in claim 35 wherein the sheath is formed of a first plastic material and the matrix is formed of a second, different plastic material.

47. A housing as in claim 35 wherein the sheath is, at least in part, movable relative to the matrix.

48. A housing as in claim 47 wherein the sheath is formed of a first plastic material and the matrix is formed of a second, different plastic material.

49. A housing as in claim 35 wherein the matrix contacts the sheath so as to minimize transfer of vibrations therebetween.

50. A housing as in claim 35 which includes an axially oriented spine, coupled to the sheath for minimizing axial compression of the sheath in response to insertion of the sheath in a human ear canal.

51. A housing as in claim 50 wherein the spine includes an atmospheric flow path.

52. A housing as in claim 51 wherein the flow path extends between first and second spaced apart ends of the sheath such that venting is provided between the ends when inserted into the ear canal.

53. A housing as in claim 35 which includes first and second coupled electronic components wherein at least one component is carried at least partly surrounded by the matrix with the other component displaced therefrom and coupled thereto by at least one flexible conductor whereby deforming the sheath in response to externally applied forces, changes the positions of the components relative to one another thereby changing the position of the conductor, at least in part relative to the sheath.

54. A housing as in claim 53 wherein one end of the sheath is deflectable relative to the other end through an angle in a range on the order of ninety to one hundred thirty-five degrees.

55. A housing as in claim 54 wherein the sheath is deflectable simultaneously with the matrix being compressed.

56. A housing as in claim 54 wherein the matrix comprises an open cell foam.

57. A housing as in claim 35 wherein one end of the sheath is open and including a faceplate coupled to the one end closing same.

58. A housing as in claim 57 wherein the faceplate is coupled to the one end in part mechanically.

59. A housing as in claim 57 wherein the faceplate is coupled to the one end at least in part by adhesive.

60. A housing as in claim 54 wherein one end of the sheath is open and including a faceplate coupled to the one end closing same and wherein the faceplate is coupled to the one end at least in part by adhesive.

61. A housing as in claim 60 which includes a port, adjacent the faceplate, for exhausting air from the sheath.

62. A housing as in claim 57 which includes a spine to facilitate insertion.

63. A housing as in claim 62 wherein the spine comprises an axially oriented vent tube.

64. A housing as in claim 63 wherein the vent tube is attached, at least intermittently to the sheath.

65. A method of audio processing comprising:

inserting a hearing aid into an ear canal so as to locate an audio output port past at least one bend in the canal, the step of inserting including compressing parts of the aid and expelling air therein in response to sliding the audio output port past the bend in the ear canal.

66. A method as in claim 65 which includes bending the aid in response to the shape of the ear canal while inserting same.

67. A method as in claim 66 which includes applying an internally produced expansive force to portions of the aid causing same to contact the ear canal forming a feedback minimizing seal and permitting air to flow into the aid.

68. A method as in claim 67 wherein in response to a change of cross

section of the ear canal, the aid changes shape correspondingly to provide a seal with the changed cross section wherein, air flows in and out of the aid in accordance therewith.

69. A method as in claim 67 which includes sensing an incident audio signal, processing same and reproducing same in the canal at the audio output port.

70. A method as in claim 67 which includes providing axial forces to facilitate insertion.

71. A method as in claim 65 which includes locating at least one electronic component within the aid within a deformable cushion wherein the cushion deforms, but not the component, during the inserting step.

72. A method of manufacturing a hearing aid comprising:

forming a hollow flexible plastic sheath having a sidewall thickness in a range on the order of 1 to 50 thousandths of an inch and a closed end with at least one audible output port formed therein;

providing axially directed forces for stiffening the sheath to facilitate insertion into a user's ear canal;

loading the interior of the sheath, at least in part, with sound processing circuitry, an output transducer, and deformable foam with the foam being compressible; and

providing an outflow from the sheath for air from the foam enabling the sheath to be compressed.

73. A method as in claim 72 which includes, prior to the loading step, forming a coupled combination of the circuitry, the output transducer and the foam in a shape corresponding to the interior of the sheath whereby during the loading step the sheath is not substantially deformed.

74. A method as in claim 72 wherein the providing step includes incorporating a spine into the sheath.

75. A method as in claim 72 wherein the providing step includes incorporating at least one of a deformable vent tube and a spine into the sheath.

76. A method as in claim 72 wherein the forming step includes forming an ear mold of a selected ear canal;

forming a compliant female impression of the ear mold;

removing the ear mold and forming a rigid shell in the female impression;

removing the rigid shell and attaching a modular interface plate thereto;

forming a compliant female impression of the exterior of the rigid shell;

forming a compliant male impression of the interior of the rigid shell;

combining the compliant female impression of the exterior of the rigid shell with the compliant male impression of the interior of the rigid shell, in the absence of the rigid shell and filling the void therebetween with a plastic which when cured has a hardness in a range on the order of 10 to 30 Shore A;

curing the plastic thereby forming the soft deformable sheath; and

removing the sheath from the mold.

77. A method as in claim 72 wherein the forming step includes forming a soft sheath with a hardness parameter less than 30 Shore A.

78. A method as in claim 72 which includes coupling a faceplate to the sheath.

79. A method as in claim 78 wherein the coupling step includes at least one of heat sealing, ultrasonic welding, adhesively attaching, mechanically attaching, radio frequency sealing.

80. A method of manufacturing a compressible hearing aid comprising;

making an impression of a user's ear canal;

creating a rigid, hollow shell with an exterior periphery in accordance with the impression of the ear canal and with an outer ear opening sized in accordance with a modular faceplate;

forming an elastomeric female mold about the exterior periphery of the rigid shell;

forming an elastomeric male mold of the interior of the rigid shell wherein the male and female molds are rotatably and axially keyed to one another;

removing the rigid shell from between the male and female molds;

forming an elastomeric skin, corresponding to the rigid shell, in the space between coupled male and female molds;

removing the elastomeric skin from the molds and filling same, in part, with a compressible matrix and, in part, with at least a receiver; and

attaching a modular element to the opening in the outer ear opening of the skin including inserting a correspondingly shaped protrusion on the element into that opening.

81. A method as in claim 80 which includes inserting at least one axially oriented spine into the skin to facilitate insertion into the user's ear canal.

82. A method as in claim 80 which includes inserting at least one axially oriented, deformable vent tube into the skin to facilitate insertion into the user's ear canal.

83. A method as in claim 80 wherein the skin forming step includes forming a skin with a sidewall having a thickness in a range on the order of 1 thousand to 30 thousandths of an inch.

84. A method as in claim 80 wherein the skin forming step includes forming a skin with a thickness less than 40 thousandths of an inch.

85. A method as in claim 80 wherein the filling step includes at least partly filling available, unoccupied volume in the skin with the compressible matrix whereby any remaining volume contains expellable ambient atmosphere.

86. A method as in claim 80 wherein the forming step includes forming a skin having a hardness parameter in a range on the order of 10 Shore A to 40 Shore A.

87. A method as in claim 80 wherein the forming step includes forming a skin having a hardness parameter with a value on the order of less than 30 Shore A.

88. A method as in claim 80 wherein the attaching step includes at least one of chemical bonding, adhesive bonding, mechanical bonding, ultrasonic bonding, heat bonding and radiant energy bonding.

89. A method as in claim 80 which includes bonding a deformable vent tube to the skin.

90. A hearing aid system comprising:

a plurality of differently sized, flexible standardized elastomeric skins with each skin having a wall thickness in a range on the order of 1 to 50 thousandths of an inch and wherein each skin has a substantially closed, canal end and an open

outer ear end;

a plurality of compressible, physically standardized electro-mechanical inserts wherein at least some of the inserts exhibit different audio processing characteristics than others and wherein each insert includes a faceplate wherein a hearing aid for a respective individual can be assembled by selecting an appropriately sized skin from the plurality and by selecting an appropriate insert whereby the insert can be positioned in the selected skin and including a region on the selected faceplate for attachment to the open outer ear end of the skin.

91. A system as in claim 90 wherein the selected faceplate is attached to the selected skin by at least one of adhesive, mechanical connection, ultraviolet activated plastic, heat, ultraviolet radiant energy, radio frequency-type radiant energy.

92. A compressible hearing aid comprising:

a non-permeable, flexible elastomeric skin which substantially bounds an interior region with a closed end having at least an acoustic output port therein and a displaced open end;

a core which includes a faceplate which carries a battery compartment, a microphone, processing circuitry coupled to the microphone, an output transducer coupled to the processing circuitry, for generating an audio output,

and a compressible matrix wherein the core substantially occupies the interior region, with the faceplate attached to the skin at the open end closing same and with the audio output of the transducer directed toward the acoustic output port whereby the skin and matrix are compressible by externally applied forces whereupon ambient atmosphere in the skin is expelled therefrom with ambient atmosphere being drawn into the skin in response to removal of the applied forces and an expansion of the matrix and the skin.

93. A hearing aid as in claim 92 which includes a deformable spine coupled to the skin, for providing stiffening, axially directed, insertion resisting forces.

94. A hearing aid as in claim 92 wherein the skin has a wall thickness, exclusive of the ends, in a range on the order of less than 50 thousandths of an inch, a hardness parameter on the order of less than thirty Shore A and is formed from one of silicone, polyethylene, polyurethane, polyvinyl chloride and latex.

95. A compressible earpiece comprising:

a cellular matrix from which air can be expelled on compression;

an elastomeric overlay which encloses the matrix except for at least one air exhaust region whereby compressing the foam expels air therein through at least the one region.

96. An earpiece as in claim 95 wherein the matrix comprises an open cell foam.

97. An earpiece as in claim 95 wherein the overlay comprises at least one of an applied coating and a sheath.

98. An earpiece as in claim 97 wherein the overlay exhibits a thickness less than fifty thousandths of an inch.

99. An earpiece as in claim 97 wherein the overlay comprises one of a silicone, a polyurethane, a latex, polyvinyl chloride; and a thermoplastic.

100. An earpiece as in claim 95 which includes an audio output transducer.

101. An earpiece as in claim 95 which includes a vent channel which extends through the matrix.

102. An earpiece as in claim 95 which includes an audio channel which extends through the matrix.

103. A hearing aid as in claim 92 which includes at least one protruding rib formed on an exterior periphery of the elastomeric skin.